

Cretaceous-Paleocene boundary in the Saratov VOLGA region as determined from Nannoplankton

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The Cretaceous-Paleogene boundary in the sections from the Saratov Volga Region may be clearly traced from replacement of the Maastrichtian chalky-marly rocks with the Paleocene clayey-siliceous ones. The upper part of the Maastrichtian there is represented by bluish gray marls with a layer of dense yellowish limestone in the top of the bed. The marls correlate with the CC25a nannoplankton sbz. The nannoplankton complex isolated from the lower part of the yellowish limestones correlates with the CC25b and CC25c sbz. The upper part of the limestones may be reliably referred to the CC26 zone.

A peculiar rock sequence, the Belogrodni fm overlies the Upper Maastrichtian limestones with distinct traces of a depositional break. This is represented by a member of alternating green glauconitic calcareous sandstones, aleurolites, siliceous calcareous clays. Shark teeth, solitary corals, poorly preserved mollusks occur in the basement and in the roof. In some parts of the Cretaceous-Paleogene boundary, boulders of Maastrichtian yellow limestones are observed, from 0,1–4 m in diameter. The thickness of a formation makes 0,2–15 m.

The rocks of the Belogrodni fm are discontinuously overlain with siliceous, slightly calcareous clays (gaizes) of the Syzran fm (100 m). The basement of the Syzran fm contains a layer of finely laminated black clays, with glauconite and poorly rounded fragments of the Belogrodni rocks.

The Belogrodni fm corresponds to the lower part of the Danian NP4 zone. The nannoplankton associations, traced from the most complete sections in the Pricaspian to the highly abridged left-bank sections of the Volsk Volga Region, allow to refer the Lower Syzran gaizes to the Early Paleocene and to correlate them with the upper part of the NP4 zone.

Over the entire examined area of the Volga right bank, the Paleocene beds lie transgressively over the broken underlying beds of the Late Maastrichtian. The greatest stratigraphic gap is characteristic of the sections from the Volga right bank; stratigraphically, this may comprise the upper part of the Maastrichtian, the Danian and probably the lowermost of the Selandian stage. The smallest stratigraphic gap is observed in the sections from the interior part of the Pricaspian Depression (Novouzenskaya, Eltonskaya key wells), with the Danian and the Selandian stages occurring in substantially larger stratigraphic extents.

The beds corresponding to the CC26 zone may probably correspond to the maximum of the Maastrichtian transgression accompanied by optimization of the biota paleoecological living environment, which is confirmed by a rich complex of foraminifers and nannoplankton and by the development of larger forms within the complexes.

The nannoplankton complexes from the Belogrodni and the Syzran fm are highly depleted. The complex generally lacks the species indicative of substantial climate cooling. The Early Paleocene marine basin might have been inherited from the Maastrichtian and the Danian ones. The latter one used to occupy a smaller area than the Maastrichtian or the Selandian basins: it advanced into the territory of the Volga right bank as major gulfs. This is testified to by the beds of the Belogrodni fm.